Active Silicon Phoenix and FireBird (CameraLink)

DCAM Version

DCAM Module	18.8.322.5609
	18.8.642.5609
DRIVER	6.86.300.5609
	7.05.140.5609
	8.13.300.5609

(for 32-bit) (for 64-bit) (for PHX; D24CL-PE1) (for FBD; 1xCLD-2PE8) (for FBD; 2PE4, 2xCLD-2PE8)

Cards

Cards	Camera Link Configuration	PC Bus Type	Support OS	Note
AS-PHX-D24CL-PE1	Base	PCI Express x1		Half Length
AS-FBD-1XCLD-2PE8	Deca	PCI Express x8 Gen2		nali Lengui
AS-FBD-2XCLD-2PE8	Dual Deca	(*15)(*22)		Half Length / Dual Slot
AS-FBD-1XCLD-2PE4L-F	Deca / Dual Base / Full / Medium	PCI Express x4 Gen2 (*15)	Windows 7 / 8 / 8.1 / 10 32-bit / 64-bit (x64)	Half Length Low Profile PCB - Full Height Bracket
AS-FBD-1XCLD-2PE4L-L	Deca / Dual Base / Full / Medium	PCI Express x4 Gen2 (*15)		Half Length Low Profile PCB - Low Height Bracket

Cameras

Fast speed CameraLink cameras

Cameras	Nickname	Supported Card	Note
C13440-20C(U)	ORCA-Flash4.0 (V3)	AS-FBD-1XCLD-2PE4L-F AS-FBD-1XCLD-2PE4L-L AS-FBD-2XCLD-2PE8	
C11440-22C(U)	ORCA-Flash4.0 (V2)	AS-FBD-1XCLD-2PE8 AS-FBD-2XCLD-2PE8	
C11440-10C	ORCA-Flash2.8		(*18)
C10000-A01	TDI Board Camera	AS-PHX-D24CL-PE1	
C10000-801	TDI Camera	1	

CameraLink cameras

Cameras	Nickname	Supported Card	Note
C8000-30			
C8484-xxC(P)			
C9100-13	ImagEM		
C9100-14	ImagEM 1K		
C9750-xxxx(N-C)	X Poy Line	AS-PHX-D24CL-PE1	
C10400-xx	X-Ray Line	AS-FRA-D24CL-FEI	
C10650-xx			
C12200-321/461	X-Ray TDI		
C12300-321			
C10800-xx-C	X-Ray Line Dual Energy		

Recommendation

It is highly recommended to disable C-state processor control in your PC's BIOS, else you may get sporadic corrupted images transferred to the PC. See Note (*23).



Active Silicon FireBird (CoaXPress) (*New)

DCAM Version

DCAM Module	18.8.642.5609	(for 64-bit)
DRIVER	8.25.400.5609	

Cards

Cards	PC Bus Type	Support OS	Note
AS-FBD-4XCXP6-2PE8	PCI Express x8 Gen2	Windows 7 / 8 / 8.1 / 10 64-bit (x64)	Half Length (*New)

Cameras

CoaXPress cameras

Cameras	Nickname	Supported Card	Note
C14120-20P	ORCA-Lightning	AS-FBD-4XCXP6-2PE8	(*New)

Recommendation

It is highly recommended to disable C-state processor control in your PC's BIOS, else you may get sporadic corrupted images transferred to the PC. See Note (*23).



Active Silicon Phoenix (LVDS/RS422)

DCAM Version

DCAM Module	18.8.322.5609	(for 32-bit)
	18.8.642.5609	(for 64-bit)
DRIVER	6.86.400.5609	

Cards

Cards	PC Bus Type	Support OS	Note
AS-PHX-D36-PE1	PCI Express x1	Windows 7 / 8 / 8.1 / 10 32-bit / 64-bit (x64)	Half Length

Cameras

LVDS/RS-422 cameras

Cameras	Nickname	Supported Cards	Note
C9750-xx	X-Rav Line	AS-PHX-D36-PE1	
C10400-xx		A3-FIX-D30-FEI	

LVDS Color camera

Cameras	Nickname	Supported Cards	Note
C7780-xx	ORCA-3CCD	AS-PHX-D36-PE1	

Recommendation

It is highly recommended to disable C-state processor control in your PC's BIOS, else you may get sporadic corrupted images transferred to the PC. See Note (*23).



GigE

DCAM Version

DCAM Module	18.8.339.5609	(for 32-bit)
	18.8.659.5609	(for 64-bit)
DRIVER	4.1.53702.5609	

Cameras

Camera or Sensors	Nickname	Support OS	Note
C12902D-40			
C12903D-40			(*New)
C12504D-56			
C12505D-56	1		
C10500D-42/43/70		Windows 7 / 8 / 8.1 / 10 32-bit / 64-bit (x64)	
C10502D-42/43/70	Flat Panel Sensor		
C10900D-40			
C10901D-40			
C11700DK-40			
C11701DK-40			

Recommendations

See the next pages.

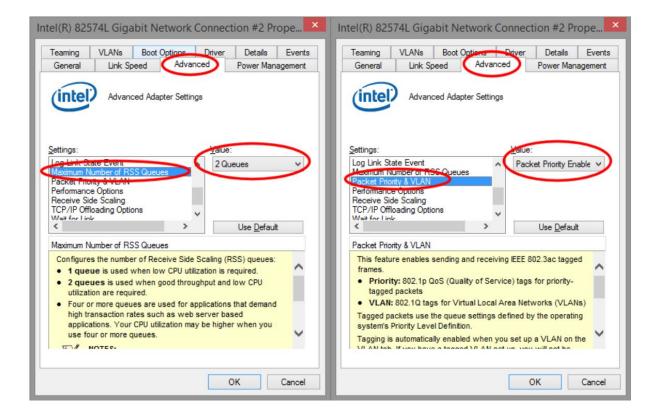


GigE – Cont'd

Recommendations

It is highly recommended to tweak these settings for the Gigabit Network Adapter for which the GigE device is connected, provided they are available for adjustment in Device Manager \ Properties for the adapter driver:

Intel(R) 82574L Gigabit Network Connection #2 Prope	Intel(R) 82574L Gigabit Network Connection #2 Prope
Teaming VLANs Boot Optione Driver Details Events General Link Speed Advanced Power Management	Teaming VLANs Boot Optione Driver Details Events General Link Speed Advanced Power Management
Advanced Adapter Settings	Advanced Adapter Settings
Settings: Gigabit Master Slave Mode Interrupt Modesition Jumbo Packet Large Send Offload V2 (IPv4) Large Send Offload V2 (IPv6) Locally Administered Address Local intervent Vue Default	Settings: Product Master Starse Mode Internuot Moderation Jumoo Facket Large Send Offload V2 (IPv4) Large Send Offload V2 (IPv6) Locally Administered Address Local internation Use Default
Jumbo Packet Enables Jumbo Packet capability for TCP/IP packets. In situations where large packets make up the majority of traffic and additional latency can be tolerated, Jumbo Packets can reduce CPU utilization and improve wire efficiency. Jumbo Packets are larger than standard Ethernet frames, which are approximately 1.5k in size. NOTE: Changing this setting may cause a momentary loss of connectivity.	Interrupt Moderation Allows the adapter to moderate interrupts. When a packet arrives, the adapter generates an interrupt, which allows the driver to handle the packet. At greater link speeds, more interrupts are created, and CPU utilization also increases. This results in poor system performance. When you enable Interrupt Moderation, the interrupt rate is lower, and the result is better system performance. WM NOTE: Changing this setting may cause a momentary
OK Cancel	OK Cancel





GigE – Cont'd

Recommendations

It is highly recommended to tweak these settings for the Gigabit Network Adapter for which the GigE device is connected, provided they are available for adjustment in Device Manager \ Properties for the adapter driver:

Intel(R) 82574L Gigabit Network Connection #2 Prope ×	Intel(R) 82574L Gigabit Network Connection #2 Prope ×
Teaming VLANs Boot Options Driver Details Events	Teaming VLANs Boot Options Driver Details Events
General Link Speed Advanced Power Management	General Link Speed (Advanced) Power Management
Advanced Adapter Settings Settings: Log Link State Event Maximum Number of RSS Queues Performance Options TCP/IP Offloading Options Wash for Link Verformance Options Configures the adapter to use settings that can improve adapter performance.	Settings: Log Link State Event Maximum Number of RSS Queues Packet Ruoting SM AN Properties Properties Nession Side Seeling: Was for Link Verformance Options Configures the adapter to use settings that can improve adapter performance.
OK Cancel	OK Cancel
Performance Options	Performance Options
Settings: Value:	Settings:
Adaptive Inter-Frame Spacing 2048	Adaptive Inter-Frame Spacing
Flow Control	Elen Control Interrupt Moderation Rate
Receive Buffers	Receive Buffers Transmit Buffers
Transmit outrers	
Use <u>D</u> efault	Use <u>D</u> efault
Receive Buffers	Interrupt Moderation Rate
Sets the number of Receive Buffers used by the adapter when copying data to memory. Increasing this value can enhance receive performance, but also consumes system memory. You might choose to increase the number of Receive Buffers if you notice a significant decrease in the performance of received traffic. If receive performance is not an issue, use the default setting.	This sets the rate at which the controller moderates or delays the generation of interrupts making it possible to optimize network throughput and CPU utilization. The Adaptive setting adjusts the interrupt rates dynamically depending on traffic type and network usage. Choosing a different setting may improve network and system performance in certain configurations.
	<u>OK</u> <u>Cancel</u>

Notables:

- a. Jumbo Packets has the biggest effect to sustainable FPS and bandwidth. Set this setting to the highest possible by the adapter driver.
- b. Receive buffers should be set to maximum allowed by the driver if the setting exists.
- c. Interrupt Moderation Disabled and\or Interrupt Moderate Rate Extreme may cause a single CPU stress to increase, but FPS is very stable at high rates.



USB

DCAM Version

DCAM Module	18.8.322.5609	(for 32-bit)
	18.8.642.5609	(for 64-bit)
DRIVER	1.2.6.5609	(for USB 3.0 and C10633)
	2.12.2.5609	(for others)

Cameras

Cameras	Nickname	USB2.0	USB3.0	Support OS	Note
C13440-20CU	ORCA-Flash4.0 (V3)		✓		
C13949-50U	Global Shutter CMOS Board Camera (12M)		~		
C13770-50U	Global Shutter CMOS Board Camera (5M)		~		
C13752-50U	Global Shutter CMOS Board Camera (3M)		~		
C14041-10U	InGaAs QVGA Camera		✓		
C12741-03	InGaAs VGA Camera		√		
C11440-62U	ORCA-Flash4.0 Board		√		(*New)
C11440-52U	ORCA-Flash4.0 Board		~	Windows 7 / 8 / 8.1 / 10	
C11440-52U30	- URUA-FIASTI4.0 DUATU				(*New)
C11440-42U C11440-42U30			~	32-bit / 64-bit (x64)	(*24)
C11440-36U Global Shutter CMOS Camera			~		
C11440-22CU	C11440-22CU ORCA-Flash4.0 (V2)		✓		(*24)
C10633-13/23	InGaAs camera	✓			
C14300-05U	X-Ray		✓		(*New)
C12849-101U C12849-102U	X-Ray CMOS		×		
C10400	0 X-Ray				
C10650	X-Ray TDI	✓			
C10990	CCD Board camera	✓			
C9728DK-10		✓			
C9730DK-10	Flat panel sensor	✓		Windows 7 / 8 / 8.1	
C9732DK-11]	✓		32-bit / 64-bit (x64)	



1394 OHCI

DCAM Versions

DCAM Module	18.8.322.5609	(for 32-bit)
	18.8.642.5609	(for 64-bit)
DRIVER	10.0.0.5609	

Cameras

Cameras	Nickname	400Mbps Max Card Speed	800Mbps Max Card Speed	Support OS	Note
C9100-24B	ImagEM X2 1K	n/a	BEST		
C11090-22B	ORCA-II	n/a	BEST		
C9100-23B	lmagEM X2	n/a	BEST	Windows 8 / 8.1 / 10	
C10600-10B	ORCA-R2	poor	BEST	32-bit / 64-bit (x64)	(*1)
C11254-10B	ORCA-D2	poor	BEST	Windows 7 (*20)/(*21)	(*1)
C4742-80-12AG	ORCA-AG	good	BEST	32-bit / 64-bit (x64)	
C8484-xxG02	ORCA-xxG	good	BEST		
C9664-01G02		good	BEST		

Required

The IEEE-1394 card must have OHCI compatibility with Microsoft's Inbox Drivers.

Recommendations

- PCI Express x1 cards are better than PCI 32-bit/64-bit cards in desktops.
- ExpressCard is better than CardBus and PCMCIA cards in notebooks.
 Avago Technologies / LSI FW643 is the best PHY/Link IC for an IEEE-1394 interface card.
- It is highly recommended to disable C-state processor control in your PC's BIOS, else you may get sporadic corrupted images transferred to the PC. See Note (*23).



Notes

- *New: New supported hardw are or OS from the 17.11.5373 release.
- *1: C10600-10B (ORCA-R2) and C11254-10B(ORCA-D2) have limitations for full performance with IEEE-1394 400Mbps port.

*2: This note is deprecated. *3: This note is deprecated. *4: This note is deprecated. *5: This note is deprecated. *6: This note is deprecated. *7: This note is deprecated. *8: This note is deprecated. *9: This note is deprecated. *10: This note is deprecated. *11: *12: This note is deprecated. This note is deprecated. *13: This note is deprecated. *14: This note is deprecated.



*15: PCle x4 and x8 slot compatibility - For example, this is information comparing PCle slot compatibility for some known Dell Precision Workstations and Dell Optiplex Desktops:

>Workstation T3600 or newer series

All slots are clearly labeled on the motherboard with their maximum link negotiation speed, width, as well as max power.

>Workstation T7500

- Slot 2 PCI Express Gen2 x16 with support for up to 300W, full length, full height. Can support x8, x4 and x1 down shift. (All Class Code cards should work, but certain cards may fall outside of spec. Report any issues.)
- Slot 4 PCI Express Gen2 x16 with support for up to 225W, full length, full height. Can support x8, x4 and x1 down shift. (All Class Code cards should work, but certain cards may fall outside of spec. Report any issues.)
- Slot 1 PCI Express Gen2 x16 wired as x8 slot with support for up to 75W half length, full height. Can support x8, x4 and x1 down shift.
- Slot 3 PCI Express Gen2 x16 wired as x8 slot with support for up to 75W full length, full height. Can support x8, x4 and x1 down shift.
- Slot 6 PCI Express Gen2 x16 wired as x4 slot with support for up to 75W full length, full height. Can support x4, x1 down shift.

>Workstation T5609

- Slots2,4 PCI Express x16 with support for up to 225W full length, full height. Can support x8, x4 and x1 down shift. (All Class Code cards should work, but certain cards may fall outside of spec. Report any issues.)
- Slot 1 PCI Express Gen2 x16 wired as x8 slot with support for up to 75W half length, full height. Can support x8, x4 and x1 down shift.
- Slot 3 PCI Express Gen2 x16 wired as x8 slot with support for up to 75W full length, full height. Can support x8, x4 and x1 down shift.

>Workstation T3500

- Slots2,4 PCI Express x16 with support for up to 225W full length, full height. Can support x8, x4 and x1 down shift. (All Class Code cards should work, but certain cards may fall outside of spec. Report any issues.)
- Slots 1,3 PCI Express x8 wired as x4 slot with support for up to 75W half length, full height.
 - Can support x4 and x1 down shift.

>Workstation T1500

Slot 1 PCI Express x16 with support for up to 75W – half length, full height. Can support x8, x4, and x1 down shift. (All Class Code cards should work, but certain cards may fall outside of spec. Report any issues.)

Here is some compatibility information for some known HP Workstations:

- > HP Z220, Z420, Z620, and Z820 Workstations
 - View the <u>Maintenance and Service Guide</u>
 - Component replacement guidelines
 - Expansion slots
- > HP Z210 CMT Workstation

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- View the Maintenance and Service Guide
 - Component replacement guidelines
 - Expansion slots



Notes – Cont'd

>Z400 Workstation (Taken from the HP Z400 Maintenance and Service Guide)

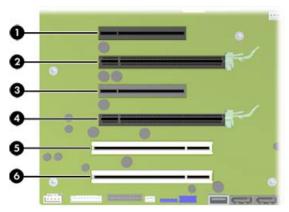
Expansion card slot identification

This section identifies and describes workstation expansion card slots, and presents card configuration information.

Slot identification and description

The following figure identifies workstation expansion card slots.

Identifying expansion card slots



The following table describes the workstation PCIe card slots.

Slot	Туре	Slot power
		(Maximum)
1	PCle2 - x8(4)	25W
2	PCle2 - x16	75W
3	PCle - x8(4)	25W
4	PCle2 - x1ó	75W

NOTE: The x1, x4, x8, and x16 designators describe the mechanical length of the slot. The number in parentheses shows how many electrical PCIe lanes are routed to the expansion slot. For example, x16(8) means that the expansion slot is mechanically a x16 length connector, with eight PCIe lanes connected. A x16 PCIe card runs at the bandwidth of the slot it is plugged into.

Slots one and three use open-ended PCle connectors, so a PCle x16 card can be inserted. Graphics cards greater than 75 watts require the use of an auxiliary power cable adapter.

Expansion card

PCIe I/O slots can support other PCIe cards with less bus bandwidth than what is physically defined for the slot.

Expansion card slot description

NOTE: The x1, x4, x8, and x16 designators describe the mechanical length of the slot. The number in parentheses shows how many electrical PCIe lanes are routed to the expansion slot. For example, x16(8) means that the expansion slot is mechanically a x16 length connector, with eight PCIe lanes connected. A x16 PCIe card runs at the bandwidth of the slot it is plugged into.

Use the following table to determine PCIe card compatibility.

lot	Mechanical compatibility	Electrical compatibility
1	x8 connector, open-ended*	PCle2 (x1, x4)
2	x16 connector	PCle2 (x1, x4, x8, x16)
3	x8 connector, open-ended"	PCle (x1, x4)
4	x16 connector	PCle2 (x1, x4, x8, x16)

- Slots one, two, and four are PCIe GEN2 slots.
- Graphics cards greater than 75 watts require the use of an auxiliary power cable adapter.

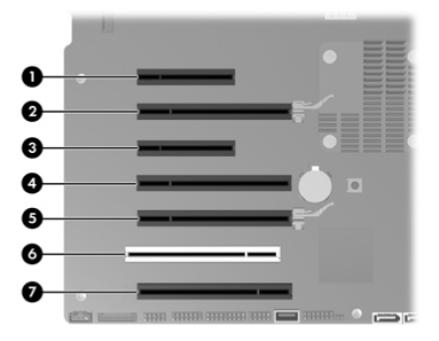


>Z800 Workstation (Taken from the HP Z800 Maintenance and Service Guide)

Expansion card slot description

The following figure identifies workstation expansion card slots.

Identifying expansion card slots



The following table describes the workstation expansion card slots.

Slot	Туре	Mechanical compatibility	Electrical compatibility	Slot powe r (Maximum)
11	PCIe2 x8(4)	x1, x4, x8, x16	x1, x4	25W
	open-ended			
21	PCIe2 ×16 ³	x1, x4, x8, x16	x1, x4, x8, x16	75W
3	PCIe ×8(4)	x1, x4, x8, x16	x1, x4	25W
	open-ended			
41	PCIe2 x16(8)	x1, x4, x8, x16	x1, x4, x8	25W
51	PCIe2 -x164	x1, x4, x8, x16	x1, x4, x8, x16	75W
7	PCIe2 x16(8)	x1, x4, x8, x16	x1, x4, x8	25W

Expansion card slot description and compatibility

PCIe GEN2 slot.

Primary graphics slot

Secondary graphics slot

NOTE: The x1, x4, x8, and x16 designators describe the number of electrical PCIe lanes routed to an expansion slot. For example, x16(8) means that the expansion slot is mechanically a x16 length connector, with eight PCIe lanes connected.

Slots one and three use open-ended PCle connectors, so a PCle x16 card can inserted. This allows the workstation to support more PCle x16 expansion cards. A x16 card typically trains and runs at the maximum lane width available by the expansion slot. The card runs at the reduced lane width, with a corresponding performance decrease.

A x16 graphics card runs at the bandwidth of the slot it is plugged into. The slot bandwidth can be x1, x4, x8, or x16. A PCIe card can be plugged into a slot with a lesser speed. It runs at that speed with a commensurate performance decrease. (Older graphics cards may not comply with this.)



- *16: This note is deprecated. *17: This note is deprecated.
- *18: The C11440-10C (ORCA-Flash 2.8) with a Phoenix PE1 card requires the camera firmw are version to be 1.1 or new er.
- *19: This note is deprecated.
- *20 For 1394 and Windows 7 only, it is recommended that you install Service Pack 1:

http://support.microsoft.com/kb/976932

Microsoft has made many improvements to their 1394 driver stack which are incorporated in SP1 and not necessarily documented or included in RTM hotfixes.

*21 For 1394 and Windows 7 only, if your experiment requires you to make many captures with various binning, sub-array, scan speed, and/or data type settings over hours of operation (usually more than 1 hour), there is a know n bug inside Microsoft's latest driver standard driver stack w hich could present itself through our API to the host application as an "Out of Resource" or "No Resource" error. When this happens, there is no way to recover capturing again from our 1394 device unless you exit your current application, pow er cycle the device, and restart the experiment manually. We have traced the root cause of the problem. It happens w hen our low er drivers cannot free 1394 lsochronous bandwidth properly through the Microsoft drivers, w e can no longer re-use that bandwidth, and further allocations w e require will fail.

If you experience the above known issue, it is recommended you install SP1 if you are not at this level:

http://support.microsoft.com/kb/976932

Microsoft has released an official hotfix to address this issue:

http://support.microsoft.com/kb/2524249

If you configured your IEEE1394 Bus controller driver for Legacy per a previous Compatibility Note recommendation, you should revert your IEEE 1394 Bus Controller driver away from Legacy and back to the Standard driver to use this hotfix and be the most stable. The Legacy driver is provided in Windows 7 only for backward driver compatibility. It will likely not evolve in stability and function beyond its current state.

- *22 The FireBird 2PE8 cards operate optimally with PCle x8 Gen2 slots. Please make sure you install this card into an electrically compatible PCle x8 Gen2 slot. If you have a Dell or HP Workstation, please reference to (*15) above.
- *23 For all PCIe interface options, it is highly recommended to disable C-state processor control in your PC's BIOS. Most PC manufacturers (such as Dell and HP) ship with C-state processor control enabled from the factory. When this is enabled, the processor may drop in and out of S0 maximum power state w hen this happens, if you are transferring image data across the PCIe bus, it may get interrupted to the point w here data becomes corrupted or lost. It is also know n that C-state being enabled can affect the overall maximum bandw idth of particular PCIe slots on the motherboard. For critical image capturing, insure S0 power state is alw ays maximum the best w ay to do it is to tw eak the BIOS for such control.



For example, if you have a Dell T3500, T5609, and/or T7500, the setting appears in the BIOS under Performance:

	C States Control
ettings - General - System Board - Date/Time - Boot Sequence - Drives - System Configuration - Video - Performance - Multi Core Support - Hyper-Threading Technology - Intel® Turbo Boost Technology - Intel® Turbo Boost Technology - Intel® SpeedStep TM - States Config - Hardware Prefetcher - Adjacent Cache Line Prefetch - Limit CPUID Value - Memory Node Interleaving - Virtualization Support - Security - Post Behavior - Post Behavior - System Logs	C States Control
	Load Defaults Apply Exit

If you have an HP Z400 or Z800 Workstation, it appears in the BIOS here:



Set Runtime Pow er Management to Disable and Idle Pow er Savings to Normal. For a further description from HP (Taken from Computer Setup(F10) Utility):

Computer	Setup—Power
----------	-------------

Option	Description
OS Power Management	 Runtime Power Management— Enable/Disable. Allows certain operating systems to reduce processor voltage and frequency when the current software load does not require the full capabilities of the processor. Idle Power Savings—Extended/Normal. Allows certain operating systems to decrease the processors power consumption when the processor is idle.

HAMAMATSU

- *24 For C11440-22CU with USB and C11440-42U, they must be connected to a USB 3.0 compliant bus, the drivers for the USB 3.0 chipset controller must be operational in Device Manager (check the card or PC manufacturer's website for proper drivers if Windows 7. Windows 8 and higher ship with in-box USB xHCl compliant drivers from Microsoft that can work with any know n USB3 chipset controller), and the USB 3.0 chipset controller must be installed/operating on a PCl Express / ExpressCard **Gen2** (5GT/s) capable slot / bus. Renesas µPD720202 is the most compatible USB host controller chipset with our hardw are.
- *25 This note is deprecated.

